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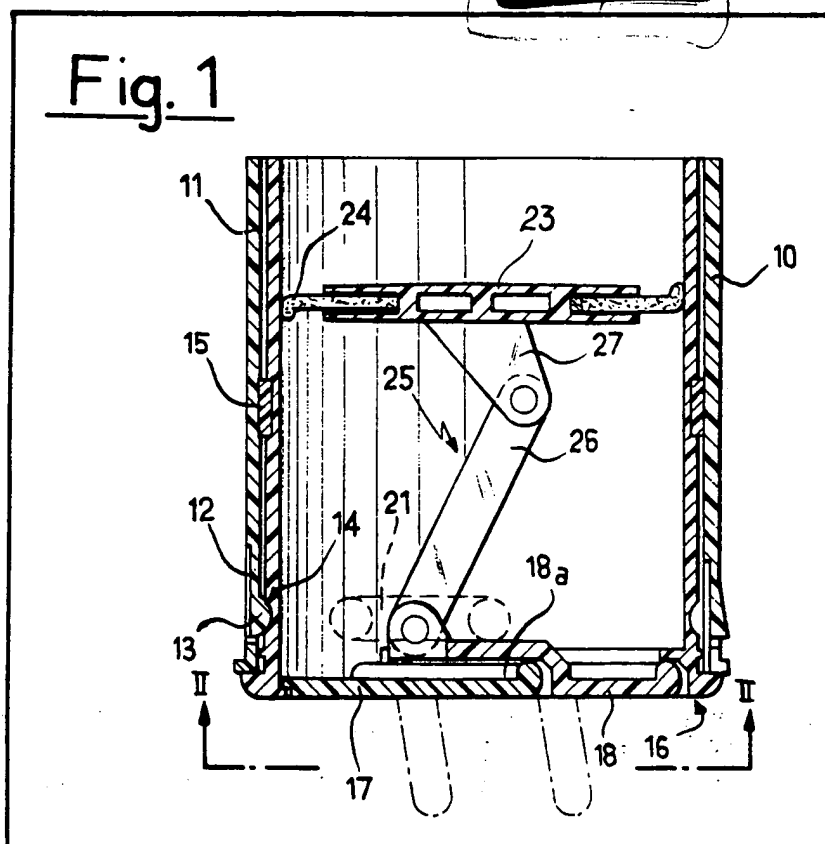
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EC4Y 1HL(54) Outlet fitting for delivering  
conditioned air to the interiors of  
motor vehicles(57) The conditioning air delivery  
fitting comprises a cylindrical manifold  
(11) having a finned delivery section  
(16) and shut off by a butterfly valve(23) controlled to open and close by  
movement of the section fins (17, 18)  
through a toggle joint linkage (25, 26,  
27). The linkage has an angular  
movement gain effect so each limited  
opening of the fins (17, 18) results in  
the shut-off valve (23) being opened to  
a nearly wide open position.

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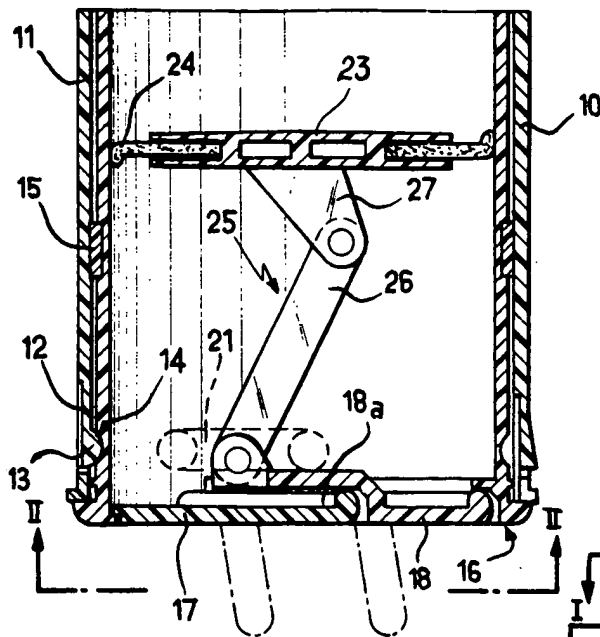


Fig. 1

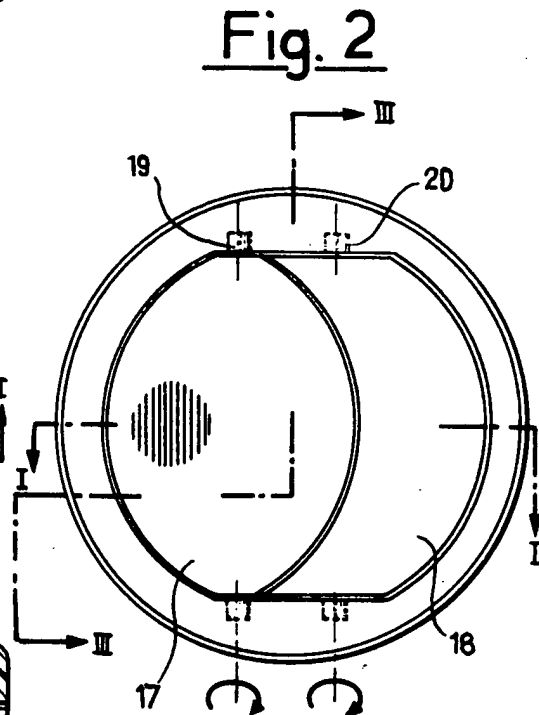


Fig. 2

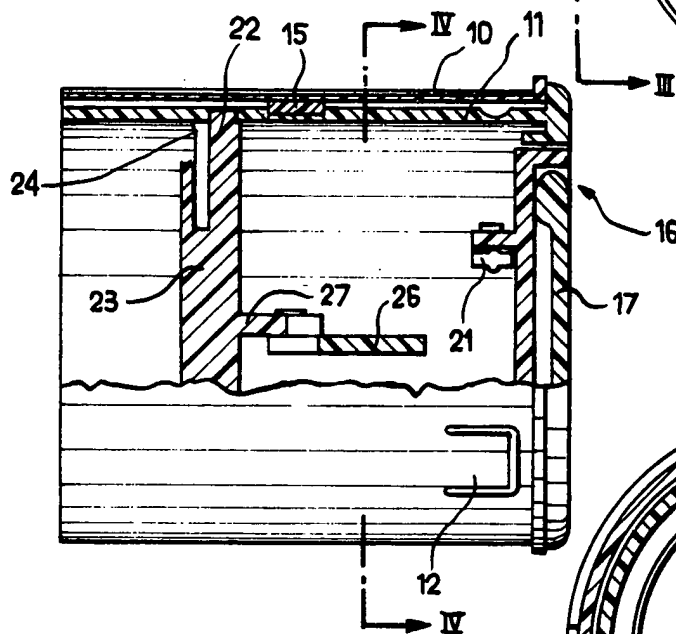
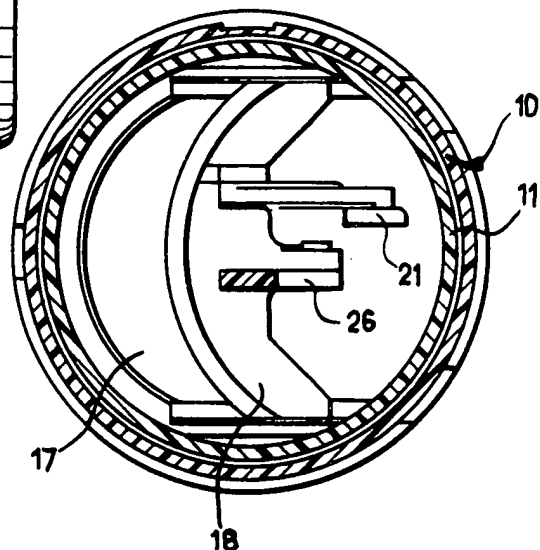


Fig. 3

Fig. 4



## SPECIFICATION

## Outlet fitting for delivering conditioned air to the interiors of motorvehicles

This invention relates to an outlet fitting for delivering conditioned air to the interiors of motorvehicles, and more particularly, to an outlet fitting of a type which comprises a cylindrical manifold having a delivery section provided with a pair of circular segment fins arranged in an array and being interconnected to move parallel to each other both for the purpose of shutting off and throttling the delivery section, and of directing the airflow.

A deficiency of outlet fittings of this general type is the inadequate seal against air leakage which they afford with the fins arranged to fully shut off the flow, and this invention is essentially directed to eliminate this problem.

According to one aspect of the present invention, the mentioned task is met by an outlet fitting for delivering conditioned air to the interiors of motorvehicles, which comprises a cylindrical manifold having a delivery section provided with a pair of arrayed and interconnected fins, characterized in that said manifold is provided with a shut-off valve of the butterfly type, said shut-off valve being controlled to open and close by said fins through a toggle joint linkage having an angular movement amplification ratio such that each limited opening of the fins results in said shut-off valve being opened to a nearly wide open position.

It will be readily appreciated that the provision of said valve and related amplified control system, while causing no disturbance to the delivery of the airflow, which undergoes no significant throttling effects, can ensure a tight closure with the fins shifted into their closed position. Said shut-off valve advantageously comprises a tilting disk pivoted along its diameter and being provided with a sealing lip of a soft material, preferably of an expanded foam polymeric material. It also carries a rigid lug, to which a small connecting rod is articulated in toggle-joint relationship, the connecting rod being further articulated to one of said arrayed fins, the ratio of the connecting rod axial and rigid lug extensions being at least equal to 2:1.

The invention will be more clearly understood from the following detailed description, with reference to the accompanying drawings, where:

Figure 1 is an axial section through the outlet fitting of this invention;

Figure 2 is a front view taken in the direction of the arrows II—II of Figure 1;

Figure 3 is a deflected sectional view taken along the line III—III of Figure 2; and

Figure 4 is a cross-sectional view taken along the line IV—IV of Figure 3.

The outlet fitting according to the invention comprises essentially an outer cylindrical case 10 for flush mounting, which contains—secured against axial movements but rotatively free—a

corresponding cylindrical manifold 11. The bond between the case 10 and manifold 11 is advantageously implemented in the form of a set of elastic fingers 12 on the case, which are provided with toric segment heads 13 for engagement in a corresponding groove 14 on the manifold, and between said case and manifold there is interposed a sealing gasket 15 of a soft material, advantageously of a soft foamed material. The manifold 11 has a delivery front section 16 fitted with a pair of fins 17—18 arranged to extend in a parallel array and being hinged for tilting movement about respective pins 19—20 to occupy a closed position in which the fins overlap and a plurality of opening positions at different angular orientations which result in as many different orientations of the delivered airflow. In the closed position, the fin 17 is partly accommodated within a recessed area 18a of the fin 18, thereby the fins can be made coplanar to each other and set flush in the plane of the delivery section. The fins are interconnected, in a manner known *per se*, by an articulated rod which ensures that they are held parallel during their angular oscillations.

In accordance with this invention, the manifold 11 accommodates, for oscillation about diametrical supporting pins 22, a disk 23 provided with a peripheral gasket 24 arranged to seal against the inside surface of the manifold such as to fully shut the section of the latter. The disk 23, which configures substantially a valve of the butterfly type, is controlled to open and close by the oscillation of the fin 18 through a drive adapted to significantly amplify the angular travel distance of the fin. Said drive or kinematic linkage comprises a toggle-joint lever, generally indicated at 25, which includes a connecting rod 26 articulated, at one end, to the fin 18 and, at the other end, to a rigid lug 27 on the disk 23. The ratio of the axial extension of the connecting rod 26 and the axial extension of the lug 27 is selected to be at least 2:1, thereby to obtain a corresponding amplification which is at least twice the angular travel of the fin transferred to the disk 23.

Thus, for even a modest extent of opening of the fins 17—18, there corresponds an amplified opening of the disk valve 23, the throttling through the manifold being practically negligible. By contrast, as the fins 17—18 are moved to close, a tight seal against leakage is effectively ensured by the peripheral gasket 24 of the disk valve 23 engaging with and deforming itself against the inner wall of the manifold, as shown in Figure 1. The fins 17—18, therefore, only serve as flow orientation baffles over a wide range of angular positions, with the added possibility of turning the manifold 11 relatively to the outer case 10.

Of course, the effects of this invention also extend to any equivalents which, on the basis of the same inventive concept, can achieve equally useful results.

**Claims**

1. An outlet fitting for delivering conditioned air to the interiors of motorvehicles, which comprises a cylindrical manifold having a delivery section  
5 provided with a pair of arrayed and interconnected fins, characterized in that said manifold is provided with a shut-off valve of the butterfly type, said shut-off valve being controlled to open and close by said fins through a toggle  
10 joint linkage having an angular movement amplification ratio such that a limited opening of the fins results in said shut-off valve being opened to a nearly fully open position.

2. An outlet fitting according to Claim 1,  
15 wherein said butterfly valve comprises a tilting disk pivoted at its diameter and having a peripheral sealing lip of a soft material, advantageously an expanded foam

polymeric material.

20 3. An outlet fitting according to the preceding claims, wherein said disk of said butterfly valve is provided with a rigid lug to which is articulated in toggle-joint relationship a small connecting rod which is further articulated to one of the arrayed  
25 fins, the ratio of the axial extensions of said connecting rod and rigid lug of the disk being at least 2:1.

4. An outlet fitting according to the preceding claims, wherein said cylindrical manifold is  
30 pivotally accommodated inside a mating flush-mounted case, and wherein a sealing gasket is interposed between said manifold and case.

5. An outlet fitting for delivering conditioned air to the interiors of motorvehicles, according to  
35 the preceding claims and as herein described and illustrated.